

RTD Fact Sheet Template

BLACK SPOT ANALYSIS RTD FACT SHEET	
Reference Measure	8.5 Stars: Automatic Enforcement of Traffic Lights
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Context and Purpose

STARS is a system for red light crossing control and automatic enforcement that consists of a photographic camera settled into protective devices.

STARS has been implemented since 2004; with MIMOSA project Bologna Municipality intends strengthen the system by:

- Crossroads equipping: activation of 20 structures for camera, connection to traffic light hardware, installation of sensors.
- New Cameras use for enforcement: new cameras will be connected to the structures on crossroads and used for a larger enforcement activity (one camera can serve more than 1 crossroad)
- Technical improvement and maintenance of the equipment
- Enforcement activity
- Data collection for evaluation

The RTD work consisted in a preliminary study aimed at define the Bologna city network black spots¹, the street intersections where to concentrate interventions to promote road safety, within which to comprehends the STARS system localization.

Description of RTD Activity

The black spots detection was realized with reference to the localizations typologies reported as follows:

NODE	*	The node is an intersection point where two or more arcs meet.
ARC	—	The arc is a series of points, joined by straight line segments, that start and end at a node.
COMPLEX CROSSING	■	Set of arcs and nodes that represents together an intersection



The black spots detection was realized with reference to the following thematic maps: (i) number of accidents (ii) accidents with deaths, (iii) death rate, (iv) injury rate, (v) accidents with pedestrians, (vi) accidents with cyclists.

Two different elaborations have been realized:

¹ A black spot is a term used in road safety management to denote a place where road traffic accidents have historically been concentrated.

- a. Specific thematic representation with reference to the universe of disposable data (this elaboration represents the basis for priority assignment of all the reports about road safety that are addressed to the Municipality;
- b. Thematic representations with reference to localizations where the thematic has taken on particular importance

The first analysis reported a great number of localizations with high number of accidents; from these² the localizations where to concentrate the infrastructural and administrative interventions are been selected considering the financial resources and the operating capacities of the Municipality. The priority was not only focused on deaths³ but also on other elements considered within the first analysis phase, as the total number of accidents and the injures rates. Priority criteria are to select interventions that guarantee at the same time: i) the greater possible reduction of the accidents with deaths, ii) the greater possible reduction of the total number of accidents and injured.

Outputs and Results

30 priority localizations have been identified, shared as follows: i) localisations where occurred, following the reported priority order, the conditions 1) recidivism of deaths between 2002-2004 2) recidivism of deaths between 1999-2004, ii) localisations where occurred, following the reported priority order, the conditions 1) greatest number of accidents between 2002-2004 2) greatest number of accidents during 2004, 3) greatest number of damages between 2002-2004:

Crossings with recidivism of deaths					
	Street/crossing	Stretch of road	incidents	injures	deaths
1	GIOSUE' CARDUCCI AVENUE	DANTE STREET	22	28	2
2	CROCIONE STREET	PIETRO FIORINI STREET	3	3	1
3	GIUSEPPE MASSARENTI STREET	GIAMBOLOGNA STREET	4	4	0

² The main results are, as follows:

- Black spots where the greatest number of total accidents happened are concentrated in the city centre and in the semi-central city area. In everyone of these localizations a number between 19 to 37 accidents has been registered;
- Black spots where the greatest number of accidents with pedestrians and cyclists happened are localised in the central and semi central area with a number between 3 and 5 accidents (years 2002-2004). This kind of accidents are not concentrated but have a larger citywide presence;
- Between 1999 to 2004, 166 dead persons in urban streets have been registered: 19 of these happened in 9 localizations (crossings or street arcs); in everyone of these localizations 2 accidents with deaths have been registered.

Example of graphic analysis reporting the total number of accidents



³ Criteria based on social costs. Following the National Safety Plan the cost for a dead person during a street accident is € 1.394.434, the cost of an injured person in a street accident is 73.631 euros.

4	LEANDRO ALBERTI STREET	ERNESTO MASI STREET	7	7	2
5	ANGELO MASINI AVENUE	FROM BAROZZI STREET TO BAROZZI STREET	5	5	0
6	TOSCANA STREET	FROM PERGOLESI STREET TO SETTE LEONCINI STREET	8	10	1
7	GIOVANNI GOZZADINI STREET	FROM PASCOLI STREET TO DEL BARACCANO SQUARE	6	6	1
8	GIUSEPPE MASSARENTI STREET	FROM BENTIVOGLI STREET TO PAOLO FABBRI STREET	8	10	0

Crossings with the greatest number of accidents and injures					
	Street/crossing	Stretch of road	incidents	injures	deaths
9	AUGUSTO MURRI STREET	ALFREDO ORIANI AVENUE	28	38	0
10	SANTO STEFANO GATE		26	30	0
11	ST ISAIA GATE		26	31	0
12	EMILIA PONENTE STREET	MARZABOTTO STREET	22	30	0
13	PIETRAMELLARA - DON MINZONI		22	27	0
14	URBANA STREET	TAGLIAPIETRE STREET	21	31	0
15	ST FELICE GATE		20	34	0
16	DELLA REPUBBLICA AVENUE	LUIGI RASI STREET	12	13	0
17	AUGUSTO MURRI STREET	ERNESTO MASI STREET	16	23	0
18	ROTONDA ITALIA	ROBERTO VIGHI AVENUE	9	11	0
19	DEL LAVORO STREET	VEZZA STREET	9	10	0
20	ANGELO MASINI AVENUE	FROM BAROZZI STREET TO XX SETTEMBRE SQUARE	13	14	1
21	WILLIAM SHAKESPEARE STREET	VITTORIO PEGLION STREET	12	22	0
22	S.DONATO STREET	ISABELLA ANDREINI STREET	18	31	0
23	CIMABUE STREET	FRANCESCO BARACCA STREET	13	21	0
24	FILIPPO BEROALDO STREET	ISABELLA ANDREINI STREET	12	19	0
25	MARCO POLO ROUNDABOUT		13	20	0
26	GIACOMO MATTEOTTI STREET	FRANCESCO ALBANI STREET	15	23	0
27	FRANCESCO ZANARDI STREET	AMEDEO PARMEGGIANI STREET	14	21	0
28	SARAGOZZA GATE		16	23	0
29	STALINGRADO STREET	CESARE GNUDI STREET	14	20	0
30	FILIPPO BEROALDO STREET	ELEONORA DUSE STREET	12	17	0

Resulting Decision-making

The 30 localizations have been submitted to other analysis in order to plan the best interventions aimed to improve the quality of the infrastructure and the safety on the road.

Based on this analysis the Star system installation and positioning was introduced within the interventions foreseen in order to reduce street accidents. The selection criteria for the individuation of the installation points (24 sections controlled by Stars, that correspond to 15 video-controlled crossings⁴) were the disposal of financial resources and the intersections' morphology (considering the feasibility to physically install the system, technical requirements permitting).

Lessons Learnt

The main insights learnt in the process of conducting the RTD activity, necessary in order to develop the entire measure process, are an analysis methodology definition for road safety and for the individuation of a priority of the interventions foreseen, methodology based on a deep knowledge of the territory.

⁴ Saffi Malvasia, Lenin Po, Mattei Martelli, San Donato Del Lavoro, San Donato Repubblica, Carducci Dante Dagnini Orti, Masi Leandro Alberti, Shakespeare Peglion, Beroaldo Andreini, Murri Gandino, M.E. Lepido Cavaliere Ducati, Togliatti De Pisis, Sabotino Vicini, Laura Bassi Mezzofanti

Cost-effectiveness

The RDT activity was a substantial element of the measure implementation, necessary to direct future decisions also regarding next interventions to be realized.

Dissemination and Exploitation

The RTD Results have been used and disseminated within the PGU (Urban Traffic Plan), that aims to improve the road safety and mobility. The analysis represents a starting point also for other measures implementation that are aimed at improving road safety as the BOL 5.2 “Safer road to school” and BOL 5.1 “Urban Traffic Safety Plan”.

The base line of data and results obtained are utilized also for the others two measures reported above and useful for making the related decisions, highlighting the most critical situations and the first results of the interventions foreseen.